**AP Chemistry: Stoichiometry Free Response Practice**

1. Answer the following questions that relate to the analysis of chemical compounds.

(a) A compound containing the elements C, H, N, and O is analyzed. When a 1.2359 g sample is burned in excess oxygen, 2.241 g of CO2 (*g*) is formed. The combustion analysis also showed that the sample contained 0.0648 g of H.

* + - 1. Determine the mass, in grams, of C in the 1.2359 g sample of the compound.
      2. When the compound is analyzed for N content only, the mass percent of N is found to be 28.84 percent. Determine the mass, in grams, of N in the original 1.2359 g sample of the compound.

(iii)Determine the mass, in grams, of O in the original 1.2359 g sample of the compound.

(iv) Determine the empirical formula of the compound.

1. Water is added to 4.267 grams of UF6. The only products are 3.730 grams of a solid containing only uranium, oxygen, and fluorine and 0.970 gram of a gas. The gas is 95.0% fluorine, and the remainder is hydrogen.
   1. From these data, determine the empirical formula of the gas.
   2. What fraction of the fluorine of the original compound is in the solid and what fraction in the gas after the reaction?
   3. What is the formula of the solid product?
   4. Write the balanced equation for the reaction between UF6 and H20. Assume that the empirical formula of the gas is the true formula.
2. Answer the following questions about BeC2O4(*s*) and its hydrate.
   1. Calculate the mass percent of carbon in the hydrated form of the solid that has the formula BeC2O4 • 3H2O
   2. When heated to 220.°C, BeC2O4 • 3H2O (*s*) dehydrates completely as represented by:

BeC2O4 • 3H2O (*s*) → BeC2O4(*s*) + 3 H2O(*g*)

If 3.21 g of BeC2O4 • 3H2O (*s*) is heated to 220°C, calculate:

(i) the mass of BeC2O4(*s*) formed, and

(ii) the volume of the H2O(*g*) released, measured at 220°C and 735 mm Hg.